

# Final Revision

## 1.The meaning of ratio and its properties

**The ratio:** Comparing between two numbers or two quantities by division.

**The ratio between two numbers** =  $\frac{1st\ number(antecedent)}{2nd\ number(consequent)}$

**Remember that:**

- (1) The ratio between two quantities of the same kind doesn't have any unit.
- (2) Length units:  $km \xrightarrow{\times 1000} m \xrightarrow{\times 10} dm \xrightarrow{\times 10} cm \xrightarrow{\times 10} mm$
- (3) Area units:  $km^2 \xrightarrow{\times 1000000} m^2 \xrightarrow{\times 100} dm^2 \xrightarrow{\times 100} cm^2 \xrightarrow{\times 100} mm^2$
- (4) Weight units:  $ton \xrightarrow{\times 1000} kg \xrightarrow{\times 1000} gm$
- (5) Capacity units:  $Litre(dm^3) \xrightarrow{\times 1000} ml(cm^3)$
- (6) Time units:  $year \xrightarrow{\times 12} month$   
 $week \xrightarrow{\times 7} day \xrightarrow{\times 24} hr \xrightarrow{\times 60} min \xrightarrow{\times 60} sec$
- (7) Agricultural Lands units:  $feddan \xrightarrow{\times 24} kirat \xrightarrow{\times 24} sahm$
- (8) Money units:  $L.E. \xrightarrow{\times 100} P.T.$

**The rate** is the ratio between two quantities of different kind

**Proportion:** is an equality of two or more ratios.

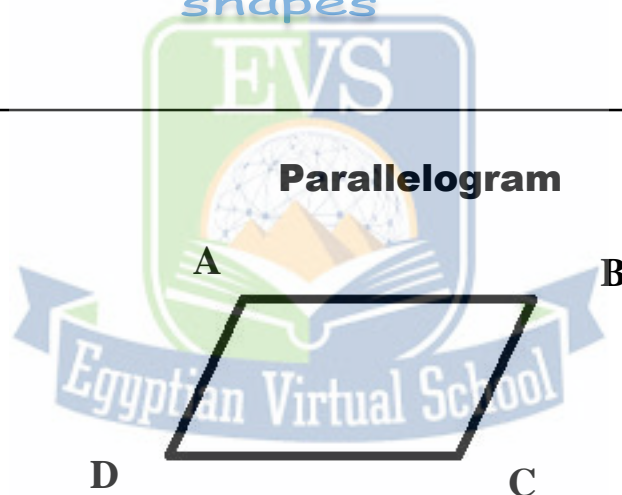
## Properties of proportion:

- (1) If we multiply (or divide) each of the two terms of a ratio by the same non-zero number, then the resultant ratio is equal to the first ratio and they together form proportion.
- (2) The product of extremes = the product of means.

**Drawing scale** = length in drawing : length in reality  $D. S. = \frac{D. L.}{R. L.}$

**The percentage is a ratio its second term is 100**

The relations between the geometrical shapes





**A parallelogram:** is a quadrilateral in which each two opposite sides are parallel.

## Properties of parallelogram:

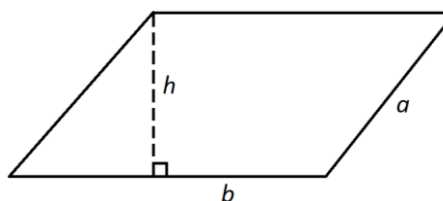
- (1) Each two opposite sides are equal in length.
- (2) Each two opposite angles are equal in measure.
- (3) The sum of the measure of each two consecutive angles is  $180^\circ$ .
- (4) The two diagonals bisect each other.

(5) Notice that:

Area of  =  $b \times h$

P. of  =  $(a + b) \times 2$

= the sum of two adjacent sides  $\times 2$



## Rectangle



The rectangle is a parallelogram with a right angle.

### Properties of rectangle:

- (1) Each two opposite sides are equal in length.
- (2) The 4 angles are equal in measure and the measure of each is  $90^\circ$ .
- (3) The sum of the measure of each two consecutive angles is  $180^\circ$ .
- (4) The two diagonals bisect each other.
- (5) The two diagonals are equal in length.

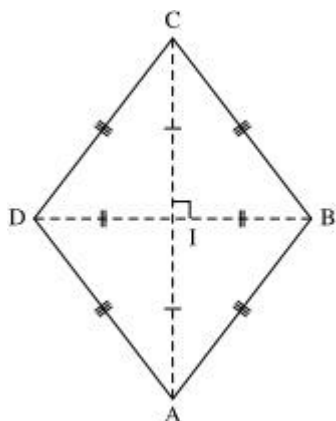
(6) Area of rectangle =  $L \times W$  ;  $L = \frac{A}{W}$  ;  $W = \frac{A}{L}$

P. of rectangle =  $(L + W) \times 2$  ;  $L = \frac{P}{2} - W$  ;  $W = \frac{P}{2} - L$

### A parallelogram is a rectangle if:

- (1) One of its angles is right.
- (2) Its two diagonals are equal in length.

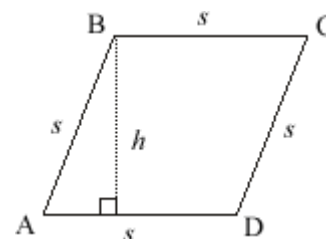
## Rhombus



The rhombus is a parallelogram in which two adjacent sides are equal in length.

### Properties of rhombus:

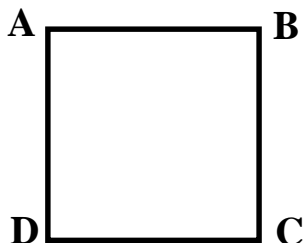
- (1) The 4 sides are equal in length.
- (2) Each two opposite angles are equal in measure.
- (3) The sum of the measure of each two consecutive angles is  $180^\circ$ .
- (4) The two diagonals bisect each other.
- (5) The two diagonals are perpendicular.
- (6) Area of rhombus =  $S \times h$   
P. of rhombus =  $S \times 4$



### A parallelogram is a rhombus if:

- (1) Two adjacent sides are equal in length.
- (2) Its two diagonals are perpendicular.

## Square



- ☞ The square is a parallelogram with a right angle and 2 adjacent sides equal in length.
- ☞ The square is a rectangle with 2 adjacent sides equal in length
- ☞ The square is a rhombus with a right angle.

### Properties of square:

- (1) The 4 sides are equal in length.
- (2) The 4 angles are equal in measure and the measure of each is  $90^\circ$ .
- (3) The sum of the measure of each two consecutive angles is  $180^\circ$ .
- (4) The two diagonals bisect each other.
- (5) The two diagonals are equal in length.
- (6) The two diagonals are perpendicular.
- (7) Area of square =  $S \times S$   
P. of square =  $S \times 4$  ;  $S = P \div 4$

### A parallelogram is a square if:

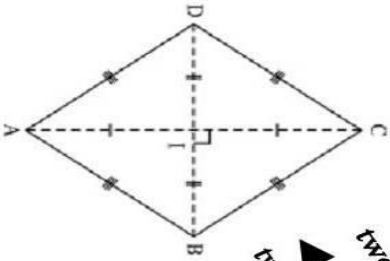
- (1) One of its angles is right and 2 adjacent sides equal in length.
- (2) One of its angles is right and its diagonals are perpendicular.
- (3) The 2 diagonals are equal in length and perpendicular.
- (4) Two adjacent sides are equal in length and its diagonals are equal in length.

# The relations between the geometrical shapes

Parallelogram



Rhombus



two diagonals are perpendicular  
two adjacent sides are equal in length

two diagonals are equal in length  
has a right angle

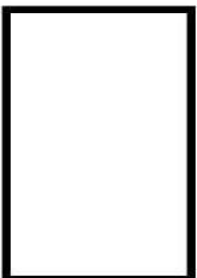
Square



two diagonals are perpendicular  
two adjacent sides are equal in length

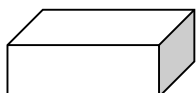
two diagonals are equal in length  
has a right angle

Rectangle



# Cuboid

The solid is any object that occupies a room in the space.



**Cuboid**

Each face as a rectangle

4 lateral faces + 2 bases

6 faces

8 vertices

12 edges



**Cube**

Each face as a square

4 lateral faces + 2 bases

6 faces

8 vertices

12 edges

## Cuboid.

[1] If the example states dimensions (length, width and height):

$$V = L \times W \times H \quad L = \frac{V}{W \times H} \quad W = \frac{V}{L \times H} \quad H = \frac{V}{L \times W}$$

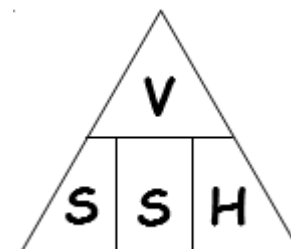
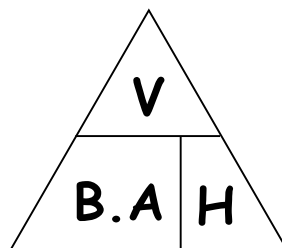
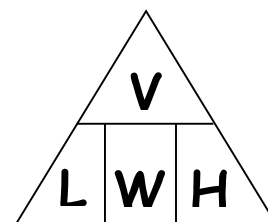
$V = \text{base area} \times \text{height}$

$$B.A = \frac{V}{H} \quad H = \frac{V}{B.A}$$

$$V = S \times S \times H$$

$$H = \frac{V}{S \times S}$$

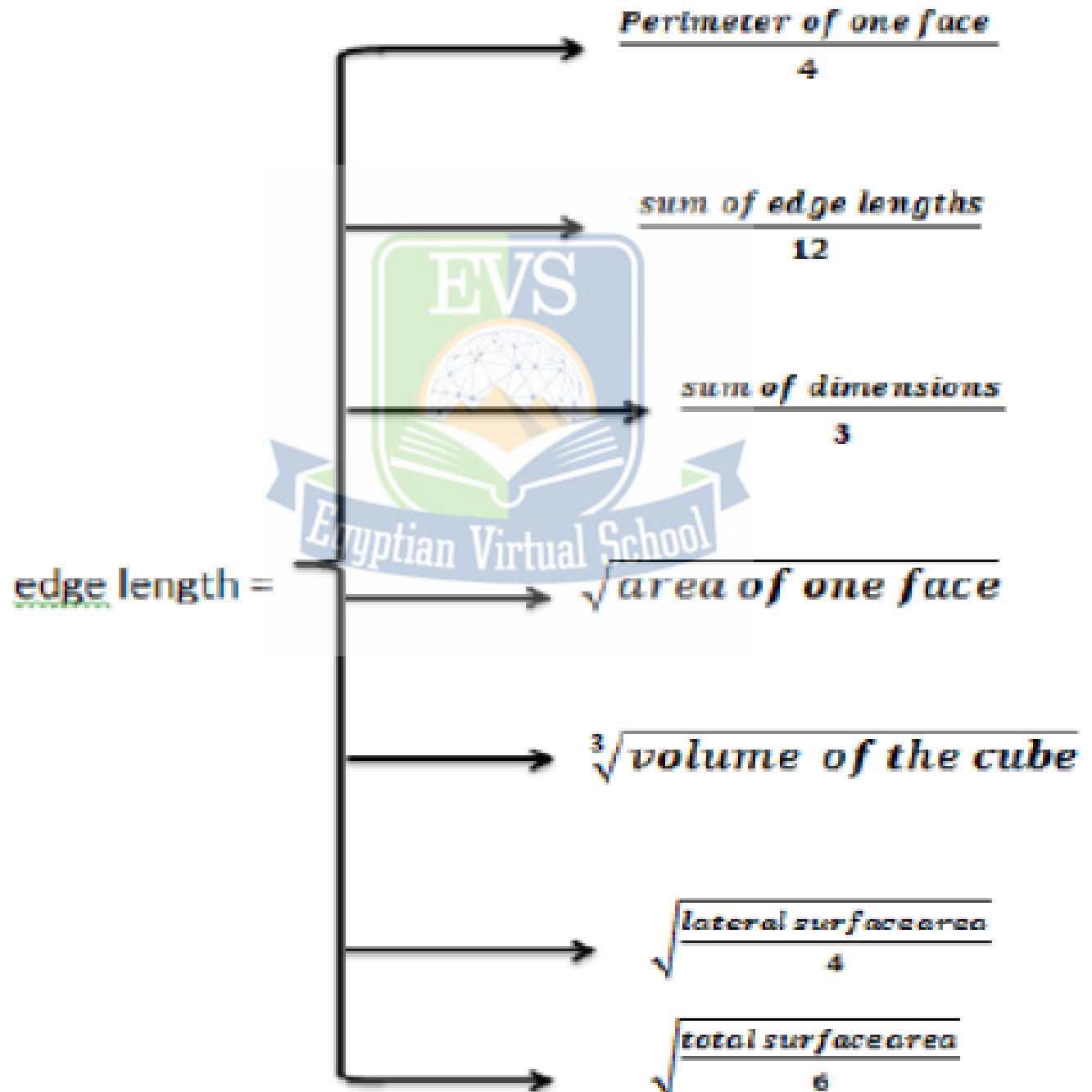
$$S \times S = \frac{V}{H}$$



# Cube

A Cube: is a cuboid with equal dimensions.

Each dimension is called edge length (S).



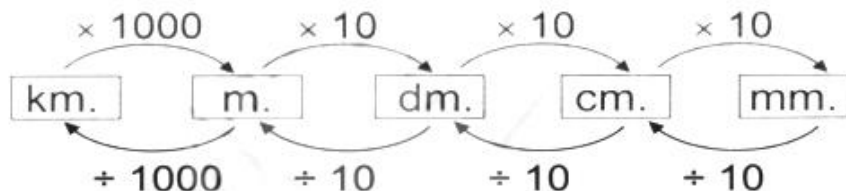


# Capacity

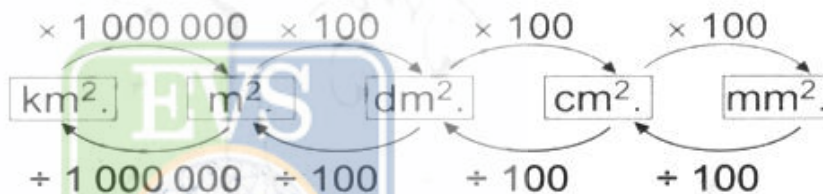
Capacity is the inner volume of a hollow solid

Litre is the unit for measuring capacity.

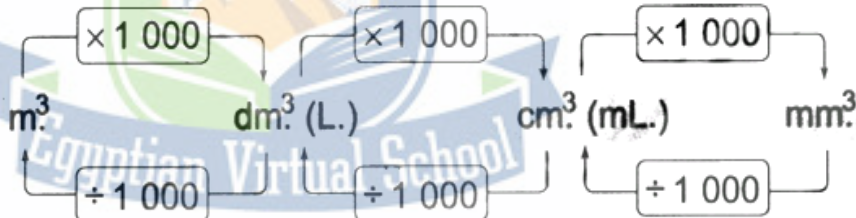
## The length units



## The area units



## The capacity units



# Statistics

## The kinds of data

- (1) **Descriptive:** Name – Stage – Grade – Address - E-mail – Favourite colour – Gender  
Nationality – Blood species
- (2) **Quantitative:** Age – Date of birth - Telephone number

**Range:** is the difference between the greatest value and the smallest value

Range = the greatest value – the smallest value.

The greatest value = range + the smallest value.

The smallest value = the greatest value – range.

The number of sets = the range  $\div$  the length of set.

The range = the number of sets  $\times$  the length of set.

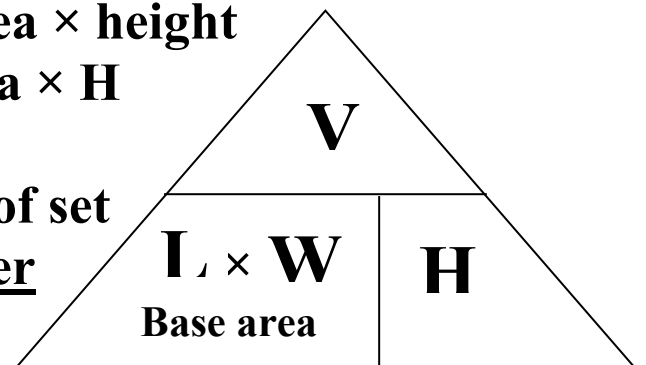
The length of set = range  $\div$  the number of sets.

## Representing data by the frequency curve

$$\text{Centre of the set} = \frac{\text{lower limit} + \text{upper limit}}{2}$$

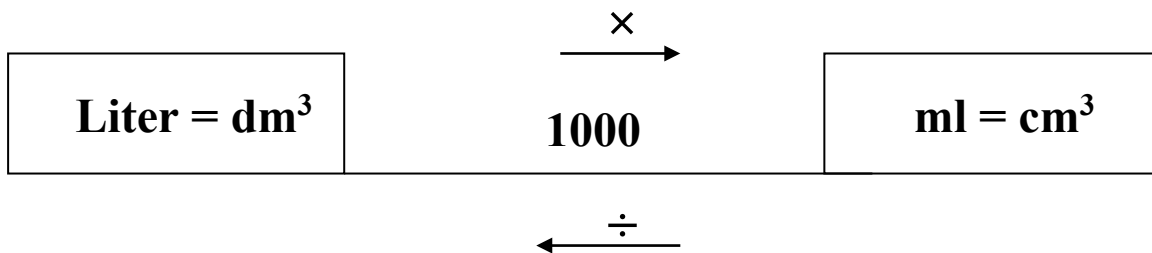
## Rules

- 1) The perimeter of square = side length  $\times 4 = L \times 4$
- 2) The area of square = side length  $\times$  itself =  $L \times L$
- 3) The perimeter of rectangle = ( length + width )  $\times 2$   
 $= ( L + W ) \times 2$
- 4) The area of rectangle = length  $\times$  width =  $L \times W$
- 5) The perimeter of triangle = sum of its side length
- 6) The area of triangle =  $\frac{1}{2} \times \text{base} \times \text{height}$   
 $= \frac{1}{2} \times b \times h$
- 7) The circumference of circle =  $\pi \times \text{diameter} = \pi \times d$   
 $= 2 \pi \times \text{radius} = \pi \times r$
- 8) The area of circle =  $2 \pi r^2$
- 9) The perimeter of any polygon = sum of its side length
- 10) The area of parallelogram = base  $\times$  height =  $b \times h$
- 11) The area of rhombus = side length  $\times$  height =  $L \times h$   
 $= \frac{1}{2} \times 1^{\text{ST}} \text{ diagonal} \times 2^{\text{nd}} \text{ diagonal}$   
 $= \frac{1}{2} \times d_1 \times d_2$
- 12) Volume of cube = edge length  $\times$  itself  $\times$  itself  
 $= S \times S \times S$
- 13) Volume of cuboid = length  $\times$  width  $\times$  height  
 $= L \times W \times H$   
 Volume of cuboid = base area  $\times$  height  
 $= \text{base area} \times H$
- 14) Rang = max – min
- 15) no. of sets = range  $\div$  length of set
- 16) Center of set =  $\frac{\text{lower} + \text{upper}}{2}$

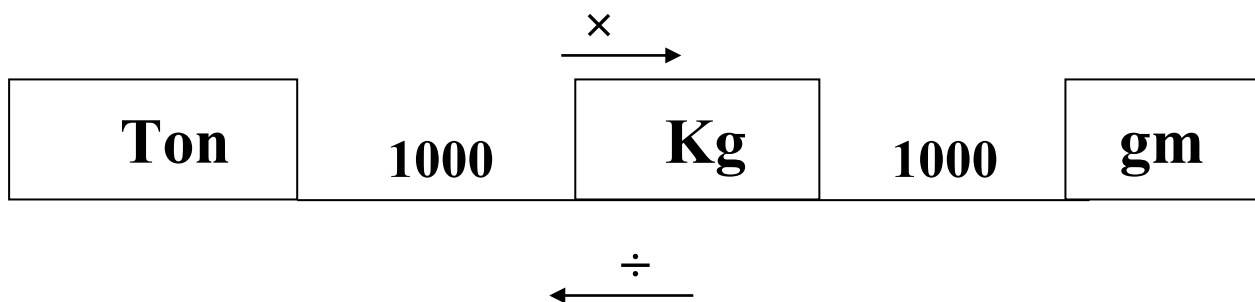


## Units

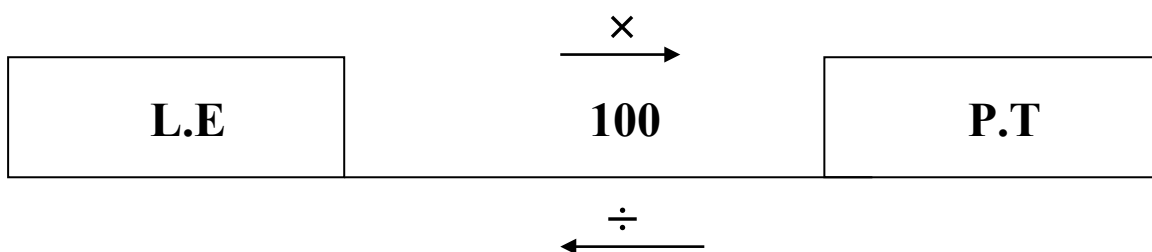
### The capacity units:

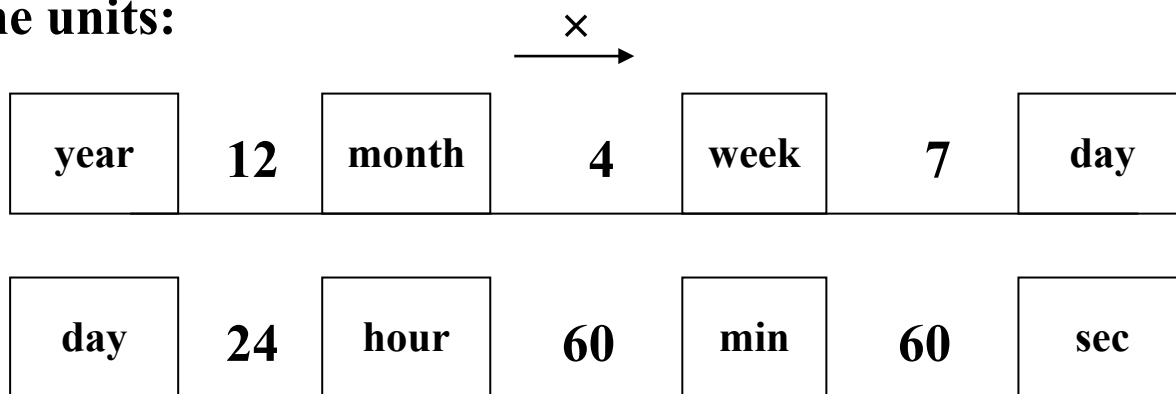
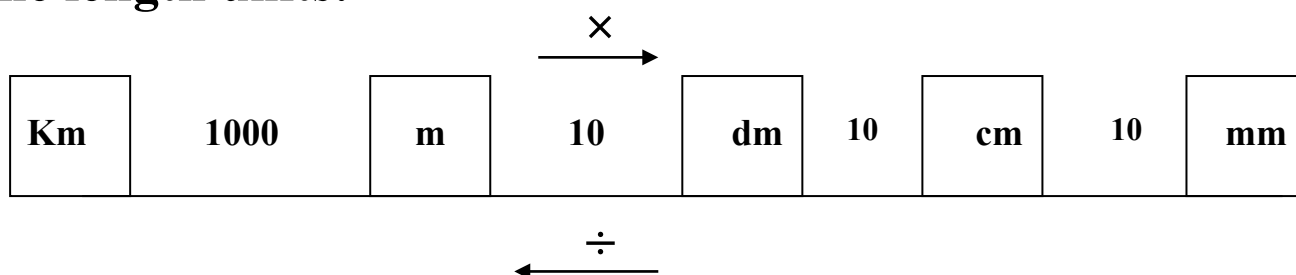
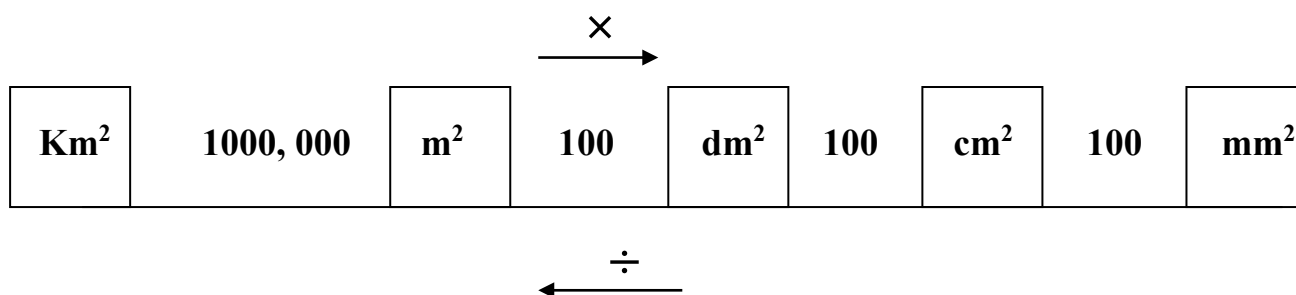
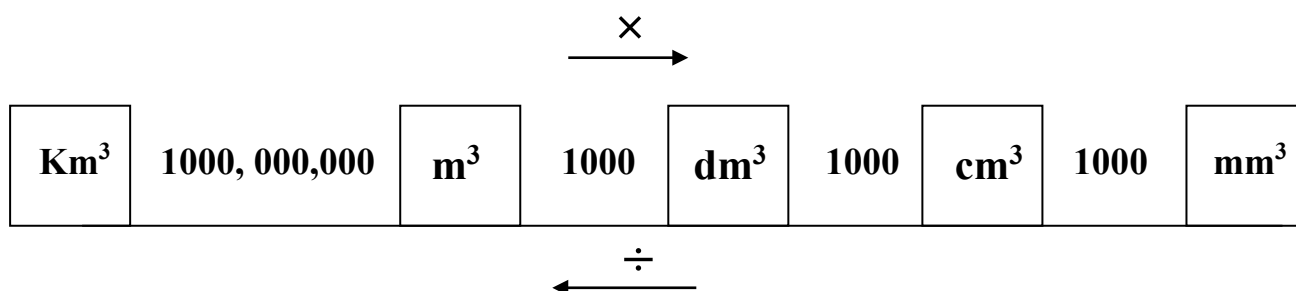


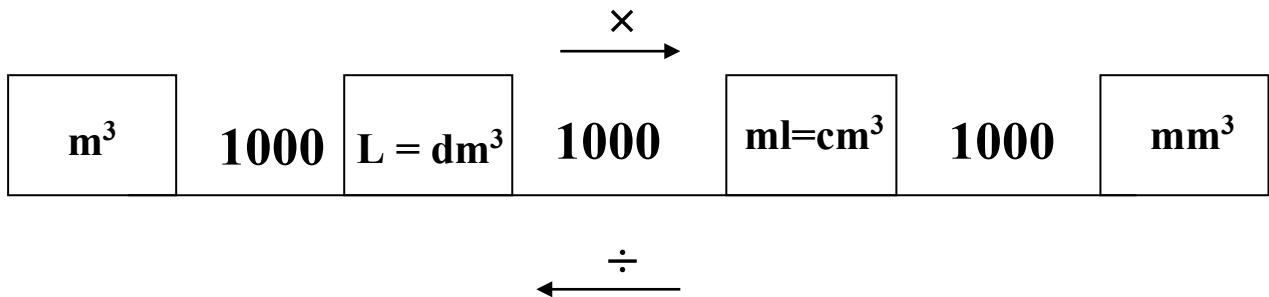
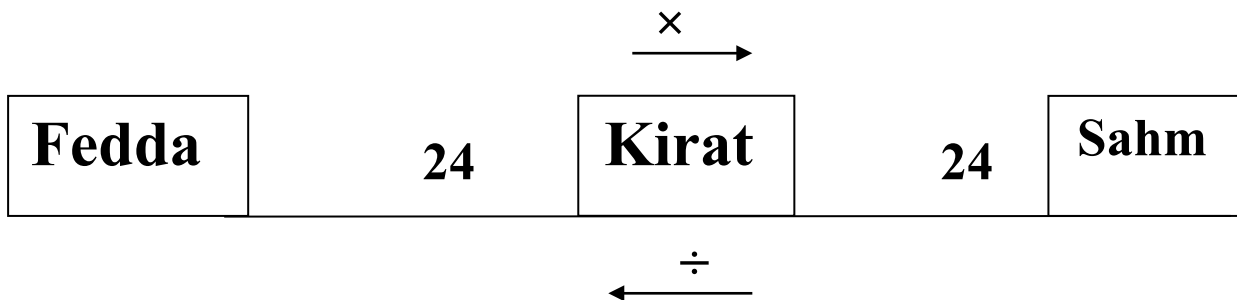
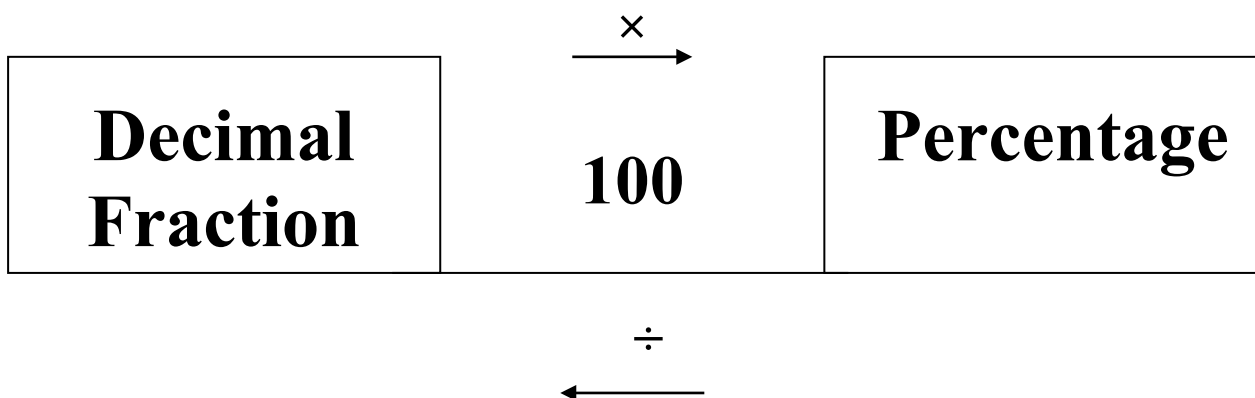
### The weight units:



### The money units:



**Time units:****The length units:****The area units:****The volume units:**

**The liquids units:****The cultivated land units:****To convert a decimal or fractions into percentage:**

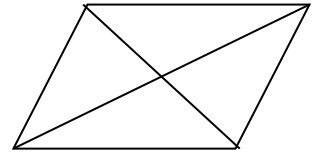
# Summary

## Unit one and two

- 1) The ratio is a method to compare between two numbers has the same type and the same units.
- 2) The rate is the ratio between two quantities of different kinds.
- 3) The product of extremes = the product of means
- 4) Drawing scale = length in drawing : length in reality
- 5) If the drawing scale  $> 1$  then its called enlargement or magnification.
- 6) If the drawing scale  $< 1$  then its called reduction or minimization.
- 7) The percentage is a ratio its second term is 100.
- 8) Profit = selling price ( S . P ) – cost price ( C . P )
- 9) Loss = cost price ( C . P ) – selling price ( S . P )
- 10) The percentage of profit =  $\frac{\text{profit}}{\text{C . P}} \times 100 \%$
- 11) The percentage of loss =  $\frac{\text{loss}}{\text{C . P}} \times 100 \%$
- 12) The total cost price = buying price + expenditures (transportation...)
- 13) The following words means difference ( - ) :  
more than , less than , exceeds , increase , decrease , smaller than ,  
bigger than , shorter than , longer than.
- 14) The ratio between side length of a square and its perimeter = 1 : 4
- 15) The ratio between side length of rhombus and its perimeter = 1 : 4
- 16) The ratio between sides of equilateral triangle and its perimeter = 1 : 3
- 17) The ratio between radius : circumference = 1 : 2  $\square$
- 18) The ratio between diameter of circle and circumference = 1 :  $\square$
- 19) The sum of measure of interior angles of triangle =  $180^\circ$

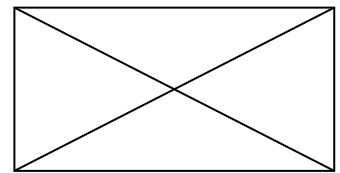
## Unit three

### The parallelogram:



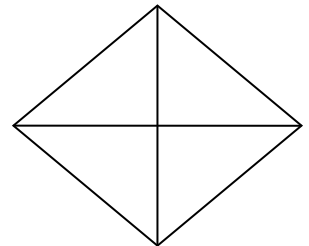
- 1) Each two opposite sides are parallel and equal in length.
- 2) Each two opposite angles are equal in measure.
- 3) The two diagonals bisect each other.
- 4) The sum of measure of each two consecutive angles is 180.

### The rectangle:



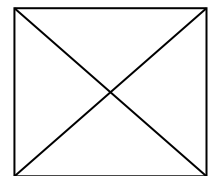
- 1) Has 4 right angles.
- 2) The two diagonals are equal in length and bisect each other.
- 3) Each two opposite sides are equal in length.

### The rhombus:



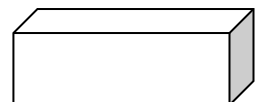
- 1) Has 4 sides equal in length.
- 2) The two diagonals are perpendicular and bisect each other.

### The square :



- 1) Has 4 right angles
- 2) Has 4 sides equal in length.
- 3) The two diagonals are equal, perpendicular and bisect each other.

### The cuboids :

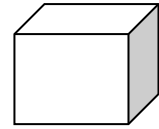


- 1) Has 6 faces each of them is rectangle.
- 2) Has 12 edges, 8 vertices and 3 dimensions ( L , W , H )
- 3) Each two opposite faces are parallel and equal .



**The cube :**

- 1) Has 6 faces each of them is square.
- 2) Has 12 edges equal in length and 8 vertices
- 3) Each two opposite faces are parallel and equal .

**Remember that**

- 1) The parallelogram with one right angle is called rectangle.
- 2) The parallelogram with two diagonals are equal in length is called rectangle.
- 3) The parallelogram with two diagonals are perpendicular is called rhombus.
- 4) The parallelogram with two adjacent sides are equal in length is called rhombus.
- 5) The parallelogram with two diagonals are perpendicular and equal in length is called square.
- 6) The parallelogram with one right angle and its diagonals are perpendicular is called square.
- 7) The parallelogram with one right angle and two adjacent sides are equal in length is called square.
- 8) The parallelogram with two diagonals are equal in length and two adjacent sides are equal in length is called square.
- 9) The square is rhombus with one right angle.
- 10) The square is rectangle with two adjacent sides is equal in length.
- 11) The rectangle is parallelogram with one right angle.
- 12) The rhombus is parallelogram with two adjacent sides is equal in length.
- 13) Trapezium is quadrilateral has only two sides are parallel.

## Unit four

- 1) There are two kinds of data: descriptive and quantitative data.
- 2) Descriptive data like name, stage, address, e-mail, job....and so on
- 3) Quantitative data like age, date, telephone no.,.... and so on.
- 4) Data form: is a form that contains some descriptive and quantitative data
- 5) Data base: is some descriptive and quantitative data of large no. of persons or establishments.
- 6) The difference between maximum and minimum value of the given data is called the range.
- 7) The difference between upper limit and lower limit of the set is called the length of this set.
- 8) Number of sets =  $\text{range} \div \text{the length of set}$
- 9) Center of set =  $\frac{\text{lower limit} + \text{upper limit}}{2}$
- 10) Range = maximum – minimum

name	parallelogram	rhombus	rectangle	square
angles	each two: opposite equal Consecutive =180	2 acute 2 obtuse	4 right	4 right
sides	each two opposite sides are equal and parallel	4 equal	each two opposite sides are equal	4 equal
Diagonals	the two diagonals bisect each other	perpen	equal	perpen =

## Sheet 1 (The Ratio)

### 1) Complete :-

- a) The ratio is .....
- b) The ratio  $\frac{5}{9}$  its antecedent is ..... , its consequent is .....
- c) L.E. 3 : P.T.30 = ..... : ..... ( in the simplest form )
- d) If **a** equals twice of **b**, then **a** : **b** = ..... : .....
- e)  $\frac{3}{5} : \frac{1}{2} = \dots\dots\dots : \dots\dots\dots$  ( in the simplest form )
- f) If we multiply each of the two terms of a ratio by the same non zero number, then the original ratio and the resulted will be .....

### 2) Write the ratio between each of the following in its simplest form

- a) 4.8 km , 1600 m
- b)  $180 \text{ dm}^2$  ,  $3.6 \text{ m}^2$
- c) 18 months, 3 years.
- d) L.E.6 , P.T. 1800
- e) 300 gm and  $1\frac{1}{2} \text{ kg}$
- f) 40 min, one hour and quarter.

### 3) Sara had L.E. 500; she spent L.E. 150 and saved the rest. Find in the simplest form the ratio between :

- a) The money she spent and the money she had.  
.....
- b) The money she spent and the money she saved.  
.....

### 4) A rectangle of length 25 cm and width 20cm find the ratio between its width and its perimeter.

.....  
.....



Can you find the ratio between its area and its perimeter?

.....



**Sheet 2 (The Ratio)****1) Complete:**

a) The ratio between the side length of a square and its perimeter

= ..... : .....

b) The ratio between the side length of an equilateral triangle and its perimeter = ..... : .....

c) The ratio between the lengths of two sides of an equilateral triangle

= ..... : .....

d) The ratio between the circumference of the circle and its diameter length

= ..... : .....

**2) Choose the correct answer:-**

a) If the area of a rectangle is  $48 \text{ cm}^2$  and its width is 6 cm, so the ratio between its length to its width is .....

(8 : 1    or    4 : 3    or    3 : 4    or    6 : 8)

b)  $7\frac{1}{2} : 3\frac{1}{2} = 15 : \dots\dots\dots$

(11    or    7    or    6    or    15)

c) Maii has got 90 out of 100 in a test, then the ratio between her marks and maximum marks is .....

( 9 : 10    or    95 : 10    or    19 : 20    or    8 : 15)

d) The ratio between the lengths of two sides of a square and its perimeter = .....

( 3 : 4    or     $\frac{1}{4}$     or     $\frac{4}{1}$     or     $\frac{1}{2}$  )

**3)** A school is of 500 pupils. If 480 pupils of them are successful, find the ratio between the number of the successful pupils to the number of the total number of the pupils.

.....

**4)** Simplify the ratio  $3\frac{1}{3} : 6.25$  to its simplest form.

.....



### Sheet 3 (The ratio and its properties)

#### 1) Complete:-

- a) The ratio between the side length of an equilateral triangle and the sum of two of its sides = ..... : .....
- b) If the length of a side of a square equals the length of a side of an equilateral triangle then the ratio between their perimeters = ..... : .....
- c) The ratio between any two sides of a rhombus = ..... : .....
- d) If  $a : b = 3 : 7$ , and  $a = 15$  kg , then  $b =$  ..... gm.
- e) If  $\frac{a}{b} = \frac{2}{5}$ , and  $b = 35$  then  $a =$  .....

- 2) The height of a building is  $\frac{1}{5}$  of Cairo Tower the if height of Cairo Tower is 180 m, find the height of the building
- .....
- .....
- .....

- 3) The perimeter of a rectangular shaped land is 360 m and the ratio between its dimensions is 3 : 2 . Find the area of this land.
- .....
- .....
- .....

- 4) Omar has  $\frac{3}{7}$  of Ahmed has .if Ahmed has L.E. 210. Find how much money Omar has.
- .....
- .....

- 5) The ratio between Amr's weight and Hidey's weight is 5 : 1 and the difference between there weights is 64 kg. Find the weight of each of them.
- .....
- .....

- 5) The ratio between two numbers is 5 : 9 and the sum of them is 280 . Find the two numbers.
- .....
- .....



## Sheet 4 (The Ratio of three numbers)

### 1) Complete:-

- a)  $\frac{1}{2} : \frac{1}{3} : \frac{1}{6} = \dots : \dots : \dots$
- b)  $4 \text{ kg} : 5000 \text{ gm} : 3.5 \text{ kg} = \dots : \dots : \dots$
- c)  $3.12 : 5.2 : 7.8 = \dots : \dots : \dots$
- d)  $2 \text{ m} : 400 \text{ cm} : 10 \text{ dm} = \dots : \dots : 1$
- e)  $210 \text{ sec} : 2.5 \text{ min} : \frac{1}{2} \text{ hrs} = \dots : \dots : \dots$

### 2) Choose the correct answer :

- a) If  $a : b = 2 : 3$  and  $b : c = 6 : 5$ , then  $a : c = \dots : \dots$   
 (  $4 : 3$     or     $4 : 5$     or     $6 : 5$     or     $3 : 4$  )
- b)  $\frac{1}{2} : \frac{3}{4} : \frac{2}{3} = \dots : \dots : \dots$   
 (  $6 : 9 : 8$     or     $6 : 8 : 9$     or     $8 : 9 : 6$     or     $8 : 6 : 9$  )
- c) In  $\Delta ABC$ ,  $m(\angle A) = \frac{2}{3} m(\angle B)$ , and  $m(\angle C) = 2 m(\angle A)$ . Then the measure of the smallest angle is .....  
 (  $40^\circ$     or     $80^\circ$     or     $90^\circ$     or     $120^\circ$  )
- d) If  $\frac{a}{b} = \frac{5}{9}$  and  $\frac{b}{c} = \frac{3}{4}$ , then  $a : c = \dots : \dots$   
 (  $5 : 36$     or     $5 : 27$     or     $5 : 12$     or     $5 : 4$  )

- 3) The ratio between ages of three persons is  $3 : 4 : 9$  and the difference between the third and the first is 54 years. Find the age of each person.
- .....
- .....
- .....

- 4) The ratio between three measures of the angles of a triangle is  $1 : 5 : 4$ . Find the measure of each angle.
- .....
- .....



## Sheet 5 (The Rate)

### 1) Complete:-

- a) The ratio between two quantities of different types is called .....
- b) Average speed =  $\frac{\text{.....}}{\text{time}}$
- c) A car covered a distance of 180 km in 1.5 hours. Then the average speed of this car is ..... km / hr
- d)  $A = \frac{1}{2} B$ , then  $A : B = \text{.....} : \text{.....}$
- e) A runner runs 640 m in 80 seconds, then his average speed is ..... m/sec
- f) If the average speed of a train is 90 km/hr and the covered distance is 315 km, then the time of the trip is ..... hours.

- 2) If three machines are needed to irrigate 32 feddans every day, calculate how many machines are needed to irrigate 256 feddans in one day?
- .....
- .....
- .....

- 3) A car consumes 10 litres of benzene to cover 140 km. **Find:**

- a) The number of the litres of benzene that the car needs to cover 238 km.
- .....
- .....

- b) The distance that the car covers to consume 15 litres.
- .....
- .....

- 4) A car traveled from Cairo to Qena in 6 hours, if the distance between the two cities is 651km, then calculate the average of the speed of the car.
- .....
- .....
- .....
- .....

## Sheet 6 (The Proportion)

### 1) Complete:-

- a) The proportion is .....
- b) From the properties of proportion, the product of the extremes = .....
- c) The forth proportion of 3 , 15 and 6 is .....
- d) If  $\frac{5}{2x} = \frac{3}{30}$  then x = .....
- e) This table shows the relation between the distance in km and the time in hours which a car covers in that time :

Distance	.....	240	400	.....
Time	2	.....	5	7

The speed of the car = ..... km. /hr.

### 2) 3 boxes of soft drink hold 36 bottles. How many boxes do we need to hold 120 bottles?

.....

.....

.....

.....

### 3) Dina bought 5 T-shirts for L.E. 175. Find how many T-shirts can be bought with L.E. 315, and then find the price of 13 T-shirts.

.....

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.....

.....

### 4) Complete the missing term in the following proportion:

- a) 5, ....., 15, 9
- b) ....., 3, 21, 9
- c) 4, 5, 8, .....
- d) 2 , 3 , ....., 6





## Sheet 7 (The Drawing Scale)

### 1) Complete:-

- a) Drawing scale is .....
- b) The real length = ..... : .....
- c) If the length of a building is 20 m , then its height in cm on a picture of drawing scale 1 : 100 will be .....
- d) If the length on a drawing is 2 cm and the real length is 8 metres, then the drawing scale = ..... : .....
- e) If the drawing scale of a map is 1 : 30 000, so the length 1 cm on the map represents ..... m on reality.

### 2) Choose the correct answer:-

- a) In magnification, the real length ..... the drawing length.  
(      >      or      =      or      <      )
- b) If the real length of an insect is 0.3 mm. and the drawing length is 1500 m, then the drawing scale will be .....  
(       $\frac{1}{5}$       or       $\frac{1}{500}$       or       $\frac{1}{5000}$       or       $\frac{1}{50000}$       )
- c) If the drawing scale is 1 : 200 and the drawing length is 4 cm, then the real length = ..... m  
(      6      or      8      or      10      or      12      )
- d) The distance between two cities is 100 km, if it is represented on a map as  $1\frac{2}{5}$  dm, then the drawing scale of this map is .....  
( 7 : 50      or      7 : 500      or      7 : 5 000      or      7 : 5000 000 )

- 3) A camera enlarges articles in the ratio 200 : 1, if the real length of an insect is 2 mm, find its length in a photo by this camera.

.....  
.....  
.....

- 4) Shady found the height of the Cairo Tower in a photo is 12 cm. If the real height is 180 m. Find the drawing scale of this picture.

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.....



## Sheet 8 (The proportion division)

1) Divide 360 among three persons in the ratio 4 : 3 : 2.

.....  
.....  
.....

2) In a school there are 350 pupils in form one. If the ratio between the number of pupils in form one to that in form two to that in form three is 7 : 4 : 3, find the number of pupils in forms two and three.

.....  
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.....

3) In a train, there are 700 passengers. If the number of the passengers in the first class =  $\frac{2}{3}$  the number in the second class and the number of the passengers in the second class =  $\frac{4}{5}$  the number in the third class. Find the number of the passengers in each class.

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4) A man died leaving L.E. 24 000 to be distributed among his wife, 3 sons and a daughter ,if the wife takes  $\frac{1}{8}$  of the whole money and the rest will be divided among the sons and the daughter so that the son takes twice as the daughter. Find the share of each of the wife, the son and the daughter

.....  
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.....  
.....

5) Divide L.E. 1 250 among three person, the first took what  $\frac{4}{3}$  the second took; the third took the same as the second took. Find the share of each one.

.....  
.....



## Sheet 9 (The percentage)

### 1) Complete:-

- a) The percentage is .....
- b)  $1 - 20\% = \dots\dots\dots$
- c)  $42\% + \dots\dots\% + 15\% = 1$
- d)  $45\% = \dots\dots\dots$  ( in a decimal form )
- e)  $5 : 16 = \dots\dots\dots\%$

### 2) Choose the correct answer:-

- a)  $45\% = \frac{9}{\dots\dots\dots}$   
( 10      or      20      or      40      or      50)
- b) 20 % of L.E. 500 = .....  
( 520      or      50      or      100      or      200)
- c) If 12 % of a number is 180, then the number will be .....  
( 1250      or      1 500      or      1 005      or      1 205)
- d)  $30\% - 0.3 = \dots\dots\dots$   
( 27 %      or      zero      or      0.27      or      27)
- e) 75 % of 100 = 25 % of .....  
( 100      or      200      or      300      or      400)

- 3) In a school, there were 500 pupils; on a day 50 pupils were absent.  
Find the percentage of those who came that day

.....

.....

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.....

- 4) The monthly salary of an employee is 470 pounds he spends 360 pounds and saves the rest. Find the percentage of the money he saves to the total salary

.....

.....

.....

.....

## Sheet 10 (The percentage)

### 1) Choose the correct answer:-

- a) Shaker got 90 % out of 50 in math test, then his mark is .....  
( 90            or    4 500            or    45            or    21)
- b) If goods are sold for L.E. 3 210 with 7 % profit, then the cost of the goods will be L.E. = .....  
( 3 217            or    3 434.7            or    224.7            or    3 000)
- c) The sum of L.E. 500 is deposited in a bank gives a rate of 10 % at the end of the year the sum becomes .....  
( 510            or    550            or    10            or    50)
- d)  $7 \% \times 5 =$  .....  
( 350            or    0.35            or    3.5            or    35)

2) Basel deposited L.E. 2 000 in a bank with a simple interest of 9 % yearly.

#### Find:

- a) The profit at the end of one year.  
b) The credit at the end of the year.

.....  
.....  
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.....

3) A merchant of bicycles found that if he sells a bicycle for L.E. 180, his loss will be 10 %. Find the cost of the bicycle.

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4) A family pays 35 % from its monthly income on housing and clothing, 50 % on food and saves the rest. Find how much will this family save monthly if its monthly income is L.E. 840?

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Sheet11( The relation between the geometrical shapes)**1) Complete:**

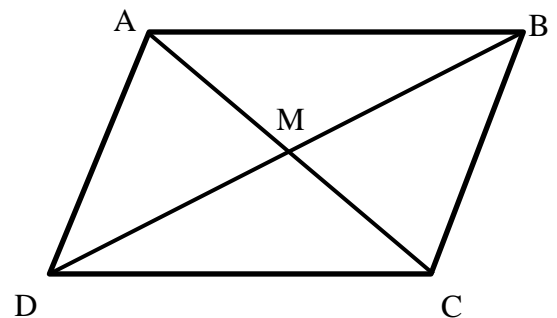
- The four sides are equal in length in each of..... and .....
- The two diagonals are equal in length in each of .....and .....
- The opposite angles are equal in measure in each of ..... , ..... , ..... and .....
- The sum of measures of the two consecutive angles equals  $180^\circ$  in each of ..... , ..... , ..... and .....
- The four angles are equal in measure in each of ..... and .....

**2) Choose the correct answer:**

- The parallelogram in which two adjacent sides are equal in length is called a ..... ( square or rectangle or rhombus or trapezium )
- The rhombus whose one of its angles is a right angle is called ..... ( square or rectangle or rhombus or trapezium )
- The rectangle whose two adjacent sides are equal in length is called ..... ( square or rectangle or rhombus or trapezium )
- The rhombus whose diagonals are equal in length is called ..... ( square or rectangle or rhombus or trapezium )
- The rectangle whose diagonals are perpendicular is called ..... ( square or rectangle or rhombus or trapezium )

**3) Complete using the opposite figure:**

- $AB = \dots\dots\dots$  ,  $\overline{CB} // \dots\dots\dots$
- If  $m(\angle C) = 120^\circ$  then  $m(\angle A) = \dots\dots\dots$  , and  $m(\angle AMB) = \dots\dots\dots$
- ABCD is called .....



## Sheet 12 ( Volume of cube )

**Volume:** is the number of cubic units which form the solid

The Volume of a cube = edge length  $\times$  edge length  $\times$  edge length  
= base area  $\times$  edge length

The base area of a cube = volume  $\div$  edge length

Edge length of a cube = volume  $\div$  base area

- 1) Find the volume of the cube of side length 7 cm.

.....  
.....

- 2) Find the volume of a cube of side length :

a) 10 cm

b) 4 cm

c) 8 cm

d) 12 cm

.....  
.....

- 3) Find the volume of the cube if the sum of its edge lengths is 60 cm.

.....  
.....

- 4) Find the volume of a cube, if its base area is  $36 \text{ cm}^2$

.....  
.....

- 5) Find the volume of a cube, if the sum of its side lengths is 132 cm

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.....  
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Sheet 13(Volume of a cuboid)

The Volume of a cuboid = length  $\times$  width  $\times$  height  
= base area  $\times$  height

The base area of a cuboid = volume  $\div$  height

Height of a cuboid = volume  $\div$  base area

- 1) How many cubic centimeters are needed to construct a cuboid of dimensions 12 cm , 6cm and 5 cm ?

.....  
.....

- 2) Find the volume of a cuboid of a square base of side length 8 cm and height 5 cm ?

.....  
.....

- 3) Find the length of a cuboid of volume  $3060 \text{ cm}^3$ , width 12 cm and height 15 cm ?

.....  
.....  
.....

- 4) Which is greater in volume a cuboid of dimensions 9.4 cm, 12.6 cm and 8 cm or a cuboid of base area  $108 \text{ cm}^2$  and height 9 cm.

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.....

## Sheet 14 (The capacity)

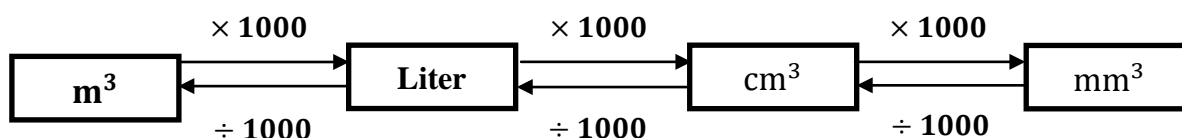
**Capacity:** is the amount that the container can hold.

**The litre:** is the unit of measuring capacity.

**The litre:** is the capacity of a cube of edge 1 dm (1dm = 10 cm)

**One litre** =  $10\text{ cm} \times 10\text{ cm} \times 10\text{ cm} = 1000\text{ cm}^3$

### How to change between the units of capacity



1) Convert each of the following:

a) 74 litres = .....  $\text{cm}^3$

b)  $5.62\text{ dm}^3 = \dots\dots\dots \text{litre}$

c) 962 litres = .....  $\text{m}^3$

d)  $45\text{ cm}^3 = \dots\dots\dots \text{ml}$

e)  $0.62\text{ dm}^3 = \dots\dots\dots \text{cm}^3$

f)  $5.49\text{ m}^3 = \dots\dots\dots \text{cm}^3$

2) Find the capacity of the cube of edge 18 cm long.

.....

3) Find the capacity of a cuboid of inner dimensions 21 cm, 17 cm and 14 cm.

.....

.....

4) A cuboid shaped box which its outer dimensions 54 cm, 40 cm and 38 cm , and the thickness of its material is 1.5 cm. Find the capacity of the box in litres, if :    a) The box with a lid                      b) The box without a lid

.....

.....

.....



- 5) The edge of a metallic cube is 15 cm long. It is melted and reshaped as a cuboid of base dimensions 8 cm and 10 cm. Find the height of the cuboid to the nearest cm.

.....  
.....  
.....

- 6) A piece of iron takes the shape of a cuboid of dimensions 24 dm, 16 dm and 8 dm. It is melted and changed into small cubes each with edge 8 cm . Find the number of these cubes.

.....  
.....  
.....

- 7) A piece of metal is dropped in a cuboid shaped water tank of base area  $288 \text{ dm}^2$ , if the height of water in the tank has increased by 60 cm. Find the volume of the metallic piece.

.....  
.....  
.....

- 8) A cuboid tank whose inner dimensions are 12 cm, 25 cm and 40 cm is full of honey, if the price of one litre is L.E 25 . Calculate the price of honey.

.....  
.....  
.....

اكتب ذاكرولي في البحث وانضم لجروبات ذاكرولي  
مع رياض الاطفال للصف الثالث الاعدادي

## Sheet 15

### (The kinds of statistical data)

#### **1) Complete each of the following:**

a) The data that describes the conditions of individuals using words is called .....

b) The data that consists of numbers to represent a certain phenomenon is called .....

d) Read the data in the opposite milk pack then classify the data into descriptive data and quantitative data.

The descriptive data are .....

The quantitative data are .....



e) The opposite figure shows a model sheet to one of the personal cards of a pupil in a school.

Look at it well then extract from it the descriptive data and quantitative data.

**Write your own personal data on this sheet.**

#### **A personal card of a pupil**

School name: .....

Grade: .....

Class:.....

School year:.....

Birthday:.....

Blood type:.....

Tel. house:.....

Mobile:.....

Photo

## Sheet 16

### (Collecting descriptive data )

**1-The following table shows the produces amount of fruit in tons by a farm in a year:**

Fruit	Mango	Apple	Orange	Banana	Watermelon	Total
No. of tons	12	8	16	10	14	60

- a) Which fruit has the greatest number of produced tons and what the percentage of it?
- b) Which fruit has the least number of produced tons and what the percentage of it?
- c) How many kgs. of watermelons are produced and what is the order of the watermelons among the produced fruit if you arrange them according to the produced amount of each kind descendingly?
- d) How many tons of bananas are produced and what is the percentage of them?

**2- A company for producing chips applied a survey to 40 persons to choose their favorite flavor ,so their responses were as follows:**

Tomato – Cheese – Shrimp – Shrimp – Salt – Spices – Tomato – Spices – Salt – Cheese – Spices – Spices – Salt – Cheese – Shrimp – Salt – Spices – Salt – Cheese Shrimp – Tomato – Shrimp – Spices – Salt – Cheese – Shrimp – Salt – Salt – Spices Shrimp – Cheese – Shrimp – Salt – Tomato – Tomato – Cheese – Spices – Salt – Salt – Shrimp.

Form the simple frequency table for this data.

- a) What flavor is the most popular? And what is its percentage?
- b) What is the order of the different flavors according to the number of persons who choose each one descendingly?

## Sheet 17

### (Collecting quantative data)

**1- Complete:**

- a) The difference between the minimum and the maximum values of the given data is called .....
- a) The range of the values : 5 , 2 , 9 , 6 , 6 and 4 is .....
- b) The length of the set of : 5- , 9- , 13- , ..... and so on is .....

**2- Here are the heights of 50 persons in centimeters:**

155	183	163	181	186	144	199	150	182	166
197	126	188	158	153	130	163	166	154	173
137	163	146	198	164	156	173	177	157	118
138	187	178	173	189	143	147	142	176	160
170	194	154	167	149	112	196	128	126	156

Using the pervious data

- a) Find the shortest, the highest ones, and the range of heights.
- b) Form the frequency table of sets, the length of each set is 10 cm.
- c) What is the percentage of persons whose heights are equal to 180 cm. or more?

**3-The following table gives the frequency distribution of the daily wages in L.E for the workers in a factory:**

Wages (sets)	50 -	60 -	70 -	80 -	90 -	100 -	Total
No. of workers (frequency)	8	10	16	10	10	7	65

- a) How many workers whose wages are from 80 to less than 90 pounds?
- b) How many workers whose wages are the least? What's their percentage?
- c) How many workers whose wages are 70 pounds or more? What's their percentage?

Sheet 18**(Representing the statistical data by the frequency curve)**

**1- The following data represents the marks in the mathematics test for students in one classroom:**

Sets	0 -	10 -	20 -	30 -	40 -	50 -
Frequency	6	10	15	20	8	4

- a) Draw the frequency curve for this distribution.
- b) Complete:
- 1) The number of students whose marks are less than 20 = .....
  - 2) The number of students whose marks are 40 and more = .....

**2-The following table gives the frequency distribution of the marks for 40 pupils in the mathematics exam:**

Sets	10 -	20 -	30 -	40 -	50 -	Total
Frequency	5	7	12	9	7	40

- a) Draw the frequency curve for these data?
- b) Which set of marks has the greatest frequency?
- c) What is the percentage of success if the mark of success is 30 marks?

**3- The following data represent the daily income of 40 persons in L.E:**

Sets	10 -	20 -	$x$ -	40 -	50 -	Total
Frequency	5	8	11	9	$y$	40

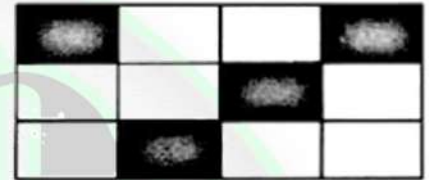
- a) Find  $x$  and  $y$ .
- b) Find the set of the greatest frequency.
- c) Find the number of persons who get L.E 30 and more daily.

# General Exercise on unit 1 from school book

## First Completion questions

① Complete the following :

In the opposite figure :



- 1) The ratio between the shaded yellow part to all the parts of the whole figure in the simplest form equals ..... : .....
- 2) The ratio between the red parts to all the parts of the whole figure in the simplest form equals ..... : .....
- 3) The ratio between the yellow parts to the red parts in the simplest form = ..... : .....

② In the opposite figure :

4)  $\frac{\text{the length of } \overline{AB}}{\text{the length of } \overline{CD}} = \frac{\dots\dots\dots}{\dots\dots\dots}$  in the simplest form

B  $\overline{\hspace{1cm}}$  3 cm.  $\overline{\hspace{1cm}}$  A

5)  $\frac{\text{the length of } \overline{EF}}{\text{the length of } \overline{CD}} = \frac{\dots\dots\dots}{\dots\dots\dots}$  in the simplest form

D  $\overline{\hspace{1cm}}$  6 cm.  $\overline{\hspace{1cm}}$  C

F  $\overline{\hspace{1cm}}$  9 cm.  $\overline{\hspace{1cm}}$  E

- 6) The length of  $\overline{EF} = 3$  times the length of .....
- 7) The length of  $\overline{CD} = \dots\dots\dots$  the length of  $\overline{EF}$



3

- 8) If  $a : b = 5 : 6$  and  $b : c = 8 : 9$ , then  $a : b : c = \dots : \dots : \dots$
- 9) If  $a : b = 2 : 3$  and  $b : c = 6 : 7$ , then  $a : c = \dots : \dots : \dots$

**Second Multiple-choice questions**

Choose the correct answer

- 10) If the ratio  $7 : 13$  is the same ratio  $x : 52$ , then  $x = \dots$   
 (a) 14 (b) 21 (c) 28 (d) 35
- 11) The side length of a square = 3 cm., then the ratio between its side length and its perimeter equals .....  
 (a) 4 (b) 3 (c)  $\frac{1}{4}$  (d)  $\frac{1}{3}$
- 12) In any equilateral triangle, the ratio between its side length and its perimeter equals .....  
 (a)  $3 : 1$  (b)  $3 : 2$  (c)  $1 : 3$  (d)  $2 : 3$
- 13) The ratio between 12 kirats to  $1 \frac{1}{2}$  feddan equals .....  
 (a)  $12 : 1.5$  (b)  $4 : 1$  (c)  $1 : 3$  (d)  $3 : 1$
- 14) If the ratio among the measurements of the angles of a triangle is  $1 : 2 : 3$ , then the measure for the smallest angle equals .....  
 (a)  $10^\circ$  (b)  $30^\circ$  (c)  $45^\circ$  (d)  $60^\circ$

15) An irrigation machine irrigates 15 feddans in 10 hours , then the rate of work for this machine is ..... feddan/hour

(a)  $\frac{2}{3}$

(b)  $\frac{3}{2}$

(c)  $\frac{5}{2}$

(d)  $\frac{5}{3}$

Thlrd

Essay questions

Answer the following questions :

16) Two lorries , the load of the first is 600 kg. and the load of the other is  $1 \frac{1}{2}$  ton. Find the ratio between the load of the first to the load of the second. (ton = 1 000 kg.)

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17) If the systolic blood pressure of a natural person is 120 and the diastolic blood pressure of the same person is 80. Find the ratio between them in the simplest form.

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- 18) If Hadi has L.E. 80 and his sister Sara has L.E. 105  
Find the ratio between what Hadi has and what his sister has of money.

- 19) If the length of a rectangle is twice its width.  
Find : (a) the ratio between the length and the perimeter of it.  
(b) the ratio between the width and the perimeter of it.

20) The area of a rectangle =  $64 \text{ cm}^2$  and its width = 4 cm.

Find : (a) the ratio between the width and the perimeter of it.

(b) the ratio between the length and the perimeter of it.

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21) In a class of a primary (mixed school) , the number of boys  $\approx \frac{4}{5}$  the number of girls , if the number of boys is 16 pupils.  
What is the number of the pupils in the class?

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22) If the ratio between what Seif saved to what his sister Jehan saved was 9 : 11 , if what Seif saved was 189 pounds.  
Find what Jehan saved.

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- 23) If the ratio between the height of Osama to the height of Ebrahim is  $9 : 8$  and the difference between their heights is 12 cm.

Find the height of each of them.

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- 24) If the ratio between the measures of the two acute angles in a right angled triangle equals  $7 : 11$  Find the measure of each of them.

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- 25) The number of pupils of sixth grade in a school is 260 pupils (boys and girls) and the ratio between the number of boys to the number of girls was  $6 : 7$

Find the number of boys and the number of girls in this grade.

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- 26) A manufacture of clothes produces 8000 pieces daily , if the ratio between what this manufacture produce from the children's clothes to the adult's clothes is 2 : 3 Find the number of pieces for the children's clothes produced in 3 days.

- 27) If the ratio between the ages of Basma , Hanaa and Shereen is 2 : 3 : 5 and the difference between the ages of Hanaa and Shereen is 4 years. Find the age of each of them.

- 28) A factory produces 8000 bottles of soft drink in 12 hours. What is the rate of production per hour ?

- 29) If  $\frac{19}{16}$  of the sum of two numbers = 95 and the ratio between them is 7 : 9 Find each of the two numbers.

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- 30) The perimeter of a rectangle = 192 cm. and the ratio between its length and its width is 7 : 5 Find the area of the rectangle.

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- 31) A piece of wire of length 30 cm. It is divided into two parts in the ratio 2 : 3 The smaller part is shaped as a square and the greater part is shaped as an equilateral triangle. Find the side length of the square and the length of the side of the equilateral triangle.

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- 32) A tap filled an aquarium in 6 hours and another tap filled the aquarium in 3 hours and a third tap filled the aquarium in 2 hours , if the three taps work together.  
How many minutes are needed to fill the aquarium?

.....

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.....

.....



# General Exercise on unit 2 from school book

## First Completion questions

- 1) Complete the following tables to make the corresponding numbers in the two rows proportional :

a

$\times \frac{2}{3}$	3	9	.....	15	.....	24	.....
	2	.....	8	.....	12	.....	18

$+\frac{2}{3}$

b

$\times \dots$	6	.....	8	.....	14	.....	18
	15	5	.....	25	.....	30	.....

$+\dots$

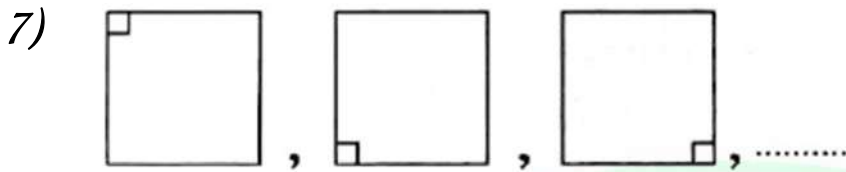
- 2) A tap pours water in the rate of 180 litre/hour , complete the following table :

Time (minutes)	15	.....	45	60	.....
number of litres	.....	90	.....	180	270

Complete :

3)  $32\% + 27\% + \dots\% = 100\%$       4)  $76\% + 41\% - \dots = 100\%$

5)  $100\% - (43\% + 35\%) = \dots\%$       6)  $1 - (37\% + 41\%) = \dots$



### Second Multiple-choice questions

Choose the correct answer from the given ones :

- 8) If  $\frac{a}{b} = \frac{c}{d}$  , then which of the following statements is true ?  
 (a)  $a \times c = b \times d$  (b)  $\frac{a}{d} = \frac{c}{b}$  (c)  $\frac{a-3}{b-3} = \frac{c}{d}$  (d)  $a \times d = b \times c$
- 9) If  $\frac{2}{5} = \frac{x}{20}$  , then  $x - 2$  equals .....  
 (a) 8 (b) 6 (c) 4 (d) 2
- 10) If  $a : b = 2 : 5$  , then  $\frac{a}{a+b}$  equals .....  
 (a) 2 : 5 (b) 2 : 7 (c) 3 : 7 (d) 7 : 2
- 11) If Hazem drinks 21 glasses of milk weekly , then the rate of what he drinks daily is .....  
 (a) 3 glasses (b) 7 glasses (c) 14 glasses (d) 20 glasses
- 12) A painter has 25 litre of paints. He uses 2.5 litre of paint per hour. If he finished his work after 5.5 hours. Then how many litres of paint are remained ? .....  
 (a) 10.25 litre (b) 11.25 litre (c) 12.75 litre (d) 13.75 litre



- 13) A car consumes 12 litre of fuel to cover adistance of 96 km. , how many litres is needed to cover a distance of 144 km. ? .....
- (a) 10                      (b) 16                      (c) 18                      (d) 20
- 14) On a map is drawn such that each , centimetre represents 5 km. , then if the distance between two villages is  $\frac{1}{2}$  km. , then the distance between them on this map in centimetre equals .....
- (a) 0.1                      (b) 0.4                      (c) 2.5                      (d) 10
- 15) The length of an insect in the picture is 4 cm. and its real length is 2 millimetre , then the drawing scale is .....
- (a) 1 : 20                      (b) 1 : 80                      (c) 20 : 1                      (d) 80 : 1
- 16) If the length of Suez Canal on a map of scale drawing 1 : 1 100 000 is 15 cm. , then its real length in km. equals .....
- (a) 155                      (b) 165                      (c) 170                      (d) 185
- 17) 12 % of 89 kg. equals approximately .....
- (a) 10 kg.                      (b) 11 kg.                      (c) 12 kg.                      (d) 13 kg.
- 18) If the price of goods in a clothes shop is 240 pounds and its price during sale is 180 pounds , then the discount percentage is .....
- (a) 15 %                      (b) 20 %                      (c) 25 %                      (d) 30 %

- 19) Mahmoud bought a computer with discount 10 % from its price which is 2 600 pounds , how much money does Mahmoud pay as a price for the computer in pounds ? .....
- (a) 2 260      (b) 2 300      (c) 2 340      (d) 2 860
- 20) A runner covered 15 % of the trace distance in 3 minutes. If he continued in the same rate , then the total time needed in minutes to cover all the distance is .....
- (a) 10      (b) 15      (c) 18      (d) 20
- 21) The number of pupils in a school in the last year was 1 172 pupils , in this year the number increased by 15 % , then the approximated number of this year in the same school equals .....
- (a) 1 800      (b) 1 600      (c) 1 500      (d) 1 400      (e) 1 200
- 22) A merchant sold his goods with profit 15 % , then the percentage of the selling price to the buying price equals .....
- (a) 15 %      (b) 85 %      (c) 115%      (d) 150%
- 23) If the ratio of the boys in a school was 60 % , if 75 % from them prefere football what is the percentage of them with respect to all the pupils of the school ? .....
- (a) 30 %      (b) 40 %      (c) 45 %      (d) 50 %



- 24) If the radius length of a circle increased with ratio 5 % , then the circumference of the circle increases in the ratio .....
- (a) 2.5 %      (b) 5 %      (c) 7.5 %      (d) 10 %
- 25) In an occasion of discounts , on of exhibtions offered a discount of ratio 20 % for its goods , then it offered another discount of ratio 5 % for its new goods. Then the percentage of the discount is .....
- (a) 23 %      (b) 24 %      (c) 25 %      (d) 26 %

**Thlrd**

**Essay questions**

Answer the following questions :

- 26) If  $\frac{x-3}{2} = \frac{5}{3}$  , find the value of  $x$

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- 27) Hoda bought 15 pens of 9 pounds for each. What is the price of 5 pens?

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28) An agricultural tractor can blough 27 feddans in  $4 \frac{1}{2}$  hours , find :

(a) The time which is needed to plough 42 feddans.

(b) The number of feddans which the tractor ploughs in 3 hours.

29) If 2.4 kg. of sugar is needed ot make 3 kg. of appricot jam.

(a) How many kg. of appricot is added to 7.2 kg. of sugar to make the same kind of jam ?

(b) How many kg. of sugar is added to 7.5 kg. of appricot to make the same kind of jam ?

30) If the drawing scale for a map is 1 : 1 000 and the length of a road equals 5 km. What is the length of this road on the map ?

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.....

31) The opposite figure represents Cairo Tower which is one of the tourists places of Cairo city. It is established in 1956 to 1961 in the shape of lotus flower. Its height is 187.2 m. If its height in the picture is 13 cm.

(a) Find the drawing scale.

(b) If the length of a neighbouring building in the picture is 3.5 cm.  
Find its real length.

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32) Compare between the first value = 45 % of 76 % and the second value = 76 % of 45

33) An alloy is made of gold copper , its weight is 70 gm. , the weight of copper in it is 7 gm. Find the percentage of the pure gold in it.

34) A man bought a piece of land with price L.E. 100 000 and after three years he sold it for L.E. 130 000 Find the percentage of his profit.

35) A man sold his car after one year of using it with price L.E. 52 000  
If its buying price was L.E. 65 000 Find the percentage of his loss.

36) Three traders , the profit of the first is 42 % , the second 28 % and the  
third is L.E. 36 000 What is the total profit in pounds ?

37) A factory for ready-made clothes has 150 workers , the owner of the  
factory decided to increase the number of workers , 30 workers in  
the first year and 15 workers in the second year. Calculate :

First : The percentage of the increasing in the first year.

Second : The percentage of the increasing in the second year.

- 38) Aman deposite a sum of money L.É. 20 000 in a bank with annual interest 9.5 %

Find the total amount which he gets at the end of one year.

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- 39) The owner of a book shop sold 25 % of notebooks and the remainder was 60 notebooks. How many notebooks were there first ?

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- 40) If the percentage of succeeded for a school equal 85 % and the number of the students in this school equals 800 students. If the ratio between the number of boys and the number of girls equals 2 : 3 Find the number of succeeded girls in this school ?

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.....



- 41) Fig. (1) represents a butterfly , its real dimensions are 18 mm. and 27 mm.  
Fig. (2) is an enlargement to it and its two dimensions are 42 mm. and  $x$  mm.



Figure (2)



Figure (1)

Find :

- (a) The magnifying ratio.  
(b) The value of  $x$  in cm.

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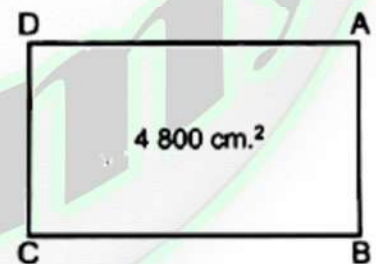
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- 42) The opposite figure represents a piece of rectangular land ABCD of area 4 800 metre square and one of its dimensions is 60 m.



- (a) Find the other dimension.  
(b) Use the geometric tools to draw  $\triangle ABC$  of the drawing scale 1 : 1 000  
(c) From the drawing , find the length of  $\overline{AC}$

- 43) Two maps are drawn , the first with drawing scale 1 : 500 000 and the second with drawing scale 1 : 1 250 000 If the distance between two cities on the first map equals 5 cm. , find the distance between the same two cities on the other map.

- 44) A trader found that if he sold a (steam bicycle) motorcycle with price L.E. 1 800 , then his loss will be 10 % Find the buying price of the steam bicycle (motorcycle) and the selling price if the trader wants to have profit 8 %



- 45) A tradesman bought goods with price L.E. 20 000 , he stored it and when he sold it he found that the profit equals 6 % of the buying price and storing cost. If the selling price was L.E. 21 624  
Calculate the cost of storing.

- 46) A tradesman bought 40 boxes of apples with price L.E. 45 for the box. He sold 80 % of the apple with profit 18 % and he sold the remained with loss 15 % Find to the nearest pound the selling price of all apples.

## General Exercise on unit 3 from school book

**First**
**Completion questions**

Complete the following :

- 1)  $5 \text{ cm}^3 = \dots\dots\dots \text{ mm}^3$
- 2)  $1\,500 \text{ mm}^3 = \dots\dots\dots \text{ cm}^3$
- 3)  $0.001 \text{ cm}^3 = \dots\dots\dots \text{ mm}^3$
- 4)  $300\,000 \text{ cm}^3 = \dots\dots\dots \text{ m}^3$
- 5)  $7\,000\,000 \text{ cm}^3 = \dots\dots\dots \text{ m}^3$
- 6)  $85\,000\,000\,000 \text{ mm}^3 = \dots\dots\dots \text{ cm}^3$
- 7)  $3 \text{ litres} = \dots\dots\dots \text{ cm}^3$
- 8)  $42 \text{ cm}^3 = \dots\dots\dots \text{ litre}$
- 9)  $370 \text{ cm}^3 = \dots\dots\dots \text{ litre}$
- 10)  $340 \text{ ml} = \dots\dots\dots \text{ litre}$
- 11)  $1.3 \text{ m}^3 = \dots\dots\dots \text{ ml}$
- 12)  $2.5 \text{ m}^3 = \dots\dots\dots \text{ litre}$

- 13) If one of the angles of a parallelogram is right , then it will be called .....
- 14) If two adjacent sides in a parallelogram are equal in length and its diagonals are perpendicular , then it is called .....
- 15) The quadrilaterals in which the two diagonals bisect each other are ..... , ..... and .....
- 16) The volume of the cube whose edge length = the side length of a square of perimeter 16 cm. = .....
- 17) If the capacity of a vessel on the shape of a cube internally equals  $\frac{1}{8}$  litre , then the edge length of the cube = ..... cm.
- 18) A case in the shape of a cube , its external volume  $\cong 1\,000\text{ cm}^3$  and its capacity =  $729\text{ cm}^3$  , then the volume of its material = .....  $\text{cm}^3$



**Second Multiple-choice questions**

Choose the correct answer from the given ones :

- 19) The best unit for estimating the volume of the classroom is .....  
 (a)  $\text{mm}^3$  (b)  $\text{cm}^3$  (c)  $\text{m}^2$  (d)  $\text{m}^3$
- 20) If the volume of a case of carton is  $0.000546 \text{ m}^3$ , then the closest volume of this case in  $\text{cm}^3$  equals .....  
 (a) 5 (b) 50 (c) 500 (d) 600
- 21)  $100 \text{ mm}^3$  equals .....  $\text{dm}^3$   
 (a)  $\frac{1}{10\,000\,000}$  (b)  $\frac{1}{1\,000\,000}$  (c)  $\frac{1}{100\,000}$  (d)  $\frac{1}{10\,000}$
- 22)  $5 \text{ m}^3 =$  .....  
 (a)  $5\,000 \text{ dm}^3$  (b)  $5\,000 \text{ cm}^3$  (c)  $500 \text{ dm}^3$  (d)  $5\,000 \text{ dm}$
- 23) The volume of a cube equals  $125 \text{ cm}^3$ , then its base area equals .....  
 (a)  $25 \text{ cm}^2$  (b)  $25 \text{ cm}$  (c)  $5 \text{ cm}^2$  (d)  $5 \text{ cm}$ .
- 24) The volume of a cuboid equals = .....  
 (a) the height  $\times$  perimeter of the base (b) width  $\times$  base area  
 (c) the height  $\times$  base area (d) length  $\times$  width + height

- 25) If the sum of the edge lengths of a cube equals 144 cm. , then its volume equals .....
- (a) 1 728 cm.      (b) 1 728 cm<sup>3</sup>      (c) 144 cm<sup>3</sup>      (d) 144 cm<sup>2</sup>
- 26) If the area of a face of a cube = 4 cm<sup>2</sup> , then its volume in cm<sup>3</sup> equals .....
- (a) 6      (b) 8      (c) 24      (d) 64
- 27) The edge length of a cube = 9 cm. , then the sum of all its edge lengths in metre = .....
- (a) 0.72      (b) 0.9      (c) 1.08      (d) 1.44
- 28) A metallic price is in the shape of a cube of edge length 40 cm. It is melted and converted to a cuboid whose base area = 2 000 cm<sup>2</sup> , then its height = .....
- (a) 16 cm.      (b) 32 cm.      (c) 64 cm.      (d) 80 cm.
- 29) A liquid is put in a glass basin in the from of a cube to be filled completely. If the capacity of the basin is one litre , then the inner edge length of the basin in cm. = .....
- (a) 0.1      (b) 1      (c) 10      (d) 100



## Third

## Essay questions

Answer the following questions:

30) Arrange the following ascendingly:

(a) 30 litres

(b) 29 000 ml.

(c) 31 000  $\text{cm}^3$ 


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31) Arrange the following descendingly:

(a) 500 000  $\text{cm}^3$ 

(b) 50 000 litres

(c) 5  $\text{m}^3$ 


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32) A vessel is filled with a liquid of volume 42 000  $\text{mm}^3$ 

(a) What is the volume of the vessel in  $\text{cm}^3$  ?

(b) What is the capacity of the vessel in litres ?

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- 33) The capacity of a bottle is  $\frac{3}{4}$  litre , is filled with Alcohol. It is wanted to put this amount in small bottles which the capacity of each is  $25 \text{ cm}^3$ . Find the number of small bottles.

- 34) Find to the nearest  $\text{cm}^3$  the volume of a cube whose edge length equals 2.1 cm.

- 35) Find the edge length of a cube whose volume is  $125 \text{ cm}^3$  , then find the area of one of its faces.

36) Find the volume of a cube if the area of one of its faces is  $49 \text{ cm}^2$

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37) Find the volume of the cube in which the sum of lengths of all its edges is 96 cm.

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38) A cube of clay of edge length 8 cm. Cubes of edge length of each = 2 cm. are made of it. Find the number of these cubes.

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39) A box in the shape of a cube in which the length of the inner edge is 36 cm. It is wanted to fill it with washing soap bars in the shape of a cube of edge length 9 cm. How many bars can be put in this box ?

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40) If a quantity of sugar with volume  $27\,000\text{ cm}^3$  is needed to can in a box ,  
Show which of the following boxes is suitable ?

- (a) A cuboid with dimensions 45 cm. , 40 cm. and 15 cm.  
(b) A cube the length of its inner dimension equals 30 cm.

41) A quantity 12 litres of honey is needed to be distributed into small  
bottles , the capacity of each of them is  $400\text{ cm}^3$   
Find the number of needed bottles.



- 42) A box for preserving food stuff in the shape of a cube whose the external edge length  $\approx 62$  cm. is made of a material of thickness 2 cm. Find the capacity of the box in litre.

- 43) Find in  $\text{cm}^3$  the volume of a cuboid whose dimensions are 8.5 cm. , 10 cm and 12 cm.

- 44) Find in cm. the height of a cuboid whose volume is  $4.8 \text{ dm}^3$  if the area of its base is  $240 \text{ cm}^2$ .

- 45) A tank in the shape of a cuboid of dimensions 7 m. , 5 m. and 9 m.  
What is the volume of water which fills its third ?

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- 46) A cuboid of dimensions 4 cm. , 5 cm. and 7 cm. and another cuboid  
in which the area of its base is  $16 \text{ cm}^2$  and of height 9 cm.  
Find the difference between their volumes.

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- 47) 10 litres of water were poured in a vessel in the shape of a cuboid , its  
base is a square of side length is 25 cm.  
Find the height of the water in the vessel.

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48) If the capacity of a tank in the shape of a cuboid is 72 000 litres.  
Find the area of the base if the height is 4 m.

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49) A brick in the shape of a cuboid of dimensions 10 cm. , 22 cm. and 8 cm. is used for building a wall fromed from 100 bricks.  
Find the volume of the wall.

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50) A metalic cube is of edge length 36 cm. , it is melted to be used in manufacture and it is converted to cuboid in which the dimensions of the base are 48 cm. and 27 cm. Calculate its height.

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- 51) Cubic boxes each of them is of edge length 50 cm. are put in the box of container in the shape of a cuboid of dimensions 3.5 m. , 2.5 m. and 2 m. Find the number of these boxes.

- 52) Water is poured in a tank of water in the shape of a cuboid in which the dimensions of the base are 12 dm. and 25 dm. and its height is 16 dm. in the rate of  $4.8 \text{ m}^3/\text{hour}$ . Find :

First : When the tank will be filled with water.

Second : The height of water after quarter of an hour.

## General Exercise on unit 4 from school book

**First****Completion questions**

Complete the following :

- 1) The difference between the greatest individual and the smallest individual of a set of values is called .....
- 2) If 78 is the greatest individual of a set and the range = 36 , then the smallest individual of this set equals .....
- 3) The following table is the frequency distribution of the marks of pupils of a class in mathematics :

The marks	25 –	30 –	35 –	40 –	45 –	50 –	55 – 60	Total
number pupils	3	4	6	10	8	7	2	40

Complete the following :

- (a) The least marks the pupil obtained in this class is .....
- (b) The percentage of the number of pupils whose marks starting from 30 marks and less than 45 is ..... %



**Second Multiple-choice questions**

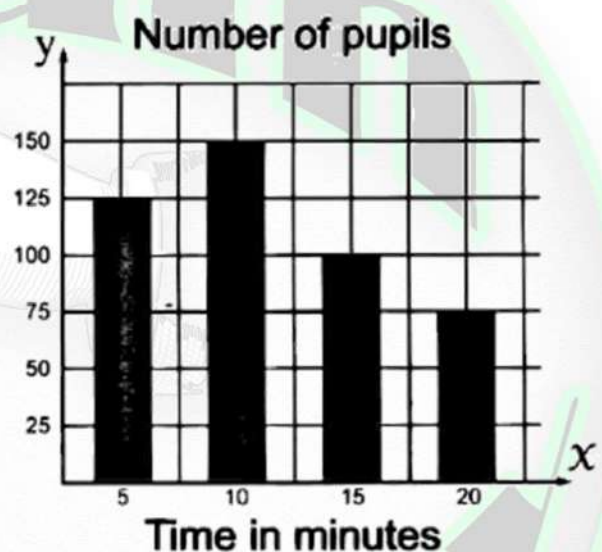
Choose the correct answer from the given ones :

4) The range of the set of values 7, 3, 6, 9 and 5 is .....

- (a) 3      (b) 4      (c) 6      (d) 12

5) The opposite graph shows the time which the pupils take to go from the house to the school, what is the number of the pupils who took more than 10 minutes? .....

- (a) 175    (b) 275    (c) 325    (d) 400



**Third** Essay questions

- 6) The following table show the times and the number of trips (in one of the bus stations for the governorates) :

Times	6 am-	8 am-	10 am-	12 am-	2 pm-	Sum
Number of trips	30	41	40	16	13	140

Draw the frequency curve for this distribution , then answer the following questions :

- a) What is the number of trips before 10 am ?
- b) What is the percentage of the number of trips from 10 am till before 12 am to the sum of trips ?



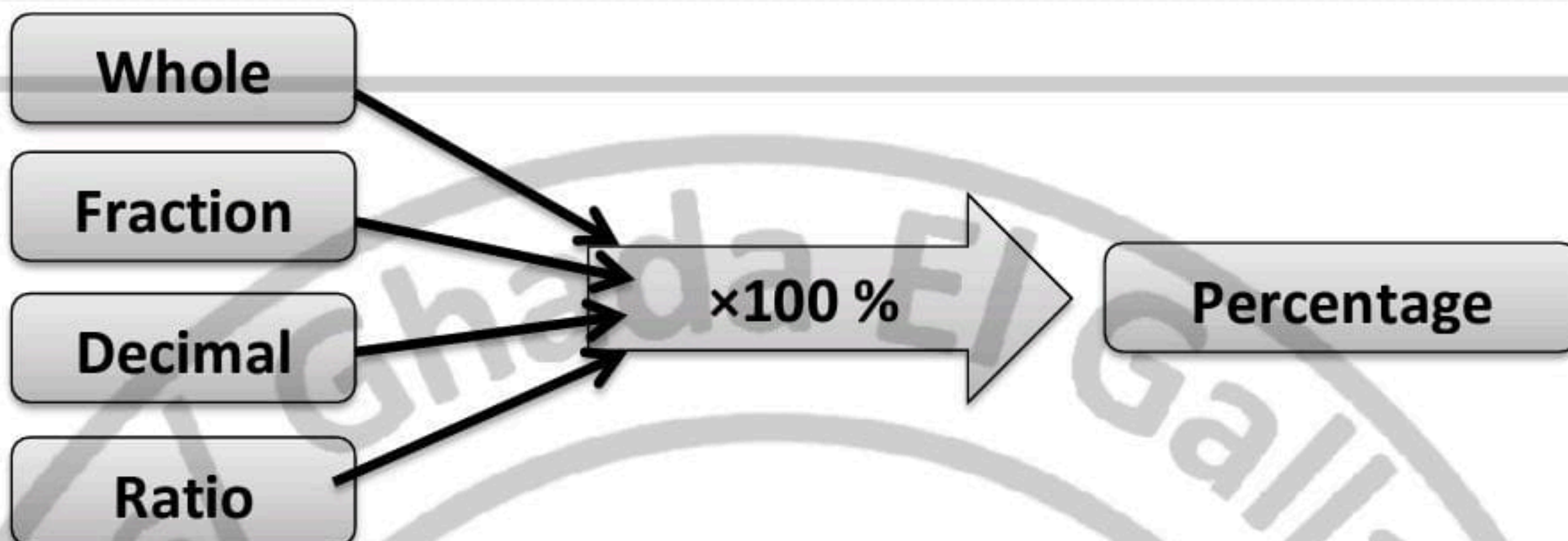
# Revision G. 6 first term

<u>The ratio</u>	Comparing between two numbers or two quantities by division.
The ratio between 2 numbers	$\frac{1^{st} \text{ number (antecedent)}}{2^{nd} \text{ number (consequent)}}$ or <b>1<sup>st</sup> no. : 2<sup>nd</sup> no.</b>
<b>1 : 4</b>	The ratio between the side length of the square (or rhombus) and its perimeter
<b>4 : 1</b>	The ratio between the perimeter of the square (or rhombus) and its side length
<b>1 : 3</b>	The ratio between the side length of equilateral triangle and its perimeter
<b>3 : 1</b>	The ratio between the perimeter of equilateral triangle and its side length
<b>1 : <math>\pi</math></b>	The ratio between the diameter of a circle and its circumference
<b><math>\pi</math> : 1</b>	The ratio between the circumference of a circle and its diameter
<b>1 : <math>2\pi</math></b>	The ratio between the radius length of a circle and its circumference
<b><math>2\pi</math> : 1</b>	The ratio between the circumference of a circle and its radius length
<b>1 : 1</b>	The ratio between two side lengths of a square
<b>4 : 3</b>	The ratio between the perimeter of a square and the perimeter of an equilateral triangle having the same side
<b>The rate</b>	the ratio between two quantities of different kind
<b>Proportion</b>	an equality of two or more ratios.
<b>The product of extremes = the product of means.</b>	
<b>Drawing scale =</b>	<b>length in drawing : length in reality</b>
<b>Drawing scale</b>	<b>Notice that:</b> (1) Both lengths should have the same units. (2) $1 \text{ km} = 100\,000 \text{ cm}$ (3) If D.S. < 1, then it refers to minimization (reduction). (4) If D.S. > 1, then it refers to enlargement (magnification).



The percentage is a ratio its second term is 100

$$\% \text{ of part} = \frac{\text{part}}{\text{total}} \times \% 100$$



Profit = selling price - cost price

$$\% \text{ of profit} = \frac{\text{profit}}{\text{cost price}} \times \% 100$$

Loss = cost price - selling price

$$\% \text{ of loss} = \frac{\text{loss}}{\text{cost price}} \times \% 100$$

Interest = after - before

$$\% \text{ of interest} = \frac{\text{interest}}{\text{before interest}} \times 100 \%$$

Discount = before - after

$$\% \text{ of discount} = \frac{\text{discount}}{\text{before discount}} \times 100 \%$$

parallelogram



A parallelogram

a quadrilateral in which each two opposite sides are parallel.

Properties of parallelogram:

- (1) Each two opposite sides are equal in length.  
 $AB = DC$  ;  $AD = BC$
- (2) Each two opposite angles are equal in measure.  
 $m(\angle A) = m(\angle C)$  ;  $m(\angle B) = m(\angle D)$
- (3) The sum of the measure of each two consecutive angles is  $180^\circ$
- (4) The two diagonals bisect each other.  $AM = CM$  ;  $BM = DM$

trapezium

a quadrilateral in which only two opposite sides are parallel.

Rectangle

a parallelogram with a right angle.

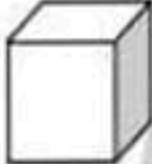
Rectangle

a parallelogram in which two diagonals are

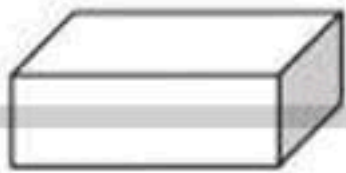
Rhombus

a parallelogram in which two adjacent sides are equal in length.



Rhombus	a parallelogram in which two diagonals are perpendicular
Rhombus	a quadrilateral in which two diagonals are perpendicular
Rhombus	a quadrilateral in which two adjacent sides are equal in length
square	a parallelogram with a right angle and 2 adjacent sides equal in length.
square	a rectangle with 2 adjacent sides equal in length
square	a rectangle with two diagonals are perpendicular
square	a rhombus with a right angle.
square	a rhombus with two diagonals are equal.
Square, Rhombus	The two diagonals are perpendicular
Square, Rectangle	The two diagonals are equal in length
The solid	any object that occupies a room in the space
 <b>Cube</b>	<p>Each face as a square  , 8 vertices, 12 edges, , 6 faces</p> <p>A Cube: is a cuboid with equal dimensions.  Volume = edge length <math>\times</math> it self <math>\times</math> it self  Area of one face = edge length <math>\times</math> edge length  Perimeter of one face = edge length <math>\times</math> 4  Sum of the edges length = edge length <math>\times</math> 12</p> <div style="text-align: center;"> <p>Sum of its all edges</p> <p><math>\times 12 \quad \updownarrow \quad \div 12</math></p> <p>Area of one face <math>\xleftarrow{S \times S} \quad \xrightarrow{\sqrt{A}} \quad \text{S} \quad \xleftarrow{S \times S \times S} \quad \xrightarrow{\sqrt[3]{V}}</math> Volume</p> <p><math>\div 4 \quad \updownarrow \quad \times 4</math></p> <p>Perimeter of one face</p> </div>





# Cuboid

Each face as a rectangle  
 , 8 vertices, 12 edges, , 6 faces

$$V = L \times W \times H$$

$$L = \frac{V}{W \times H}$$

$$H = \frac{V}{L \times W}$$

Or

$$W = \frac{V}{L \times H}$$



$V = \text{base area} \times \text{height}$

$$B.A = \frac{V}{H}$$

$$H = \frac{V}{B.A}$$

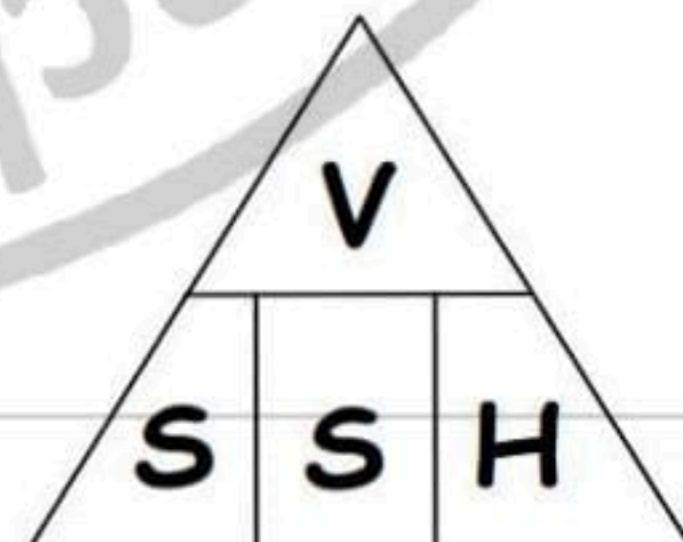


cuboid with a square base

$$V = S \times S \times H$$

$$H = \frac{V}{S \times S}$$

$$S \times S = \frac{V}{H}$$





Range: is the difference between the greatest value and the smallest value

Range = the greatest value - the smallest value.

The greatest value = range + the smallest value.

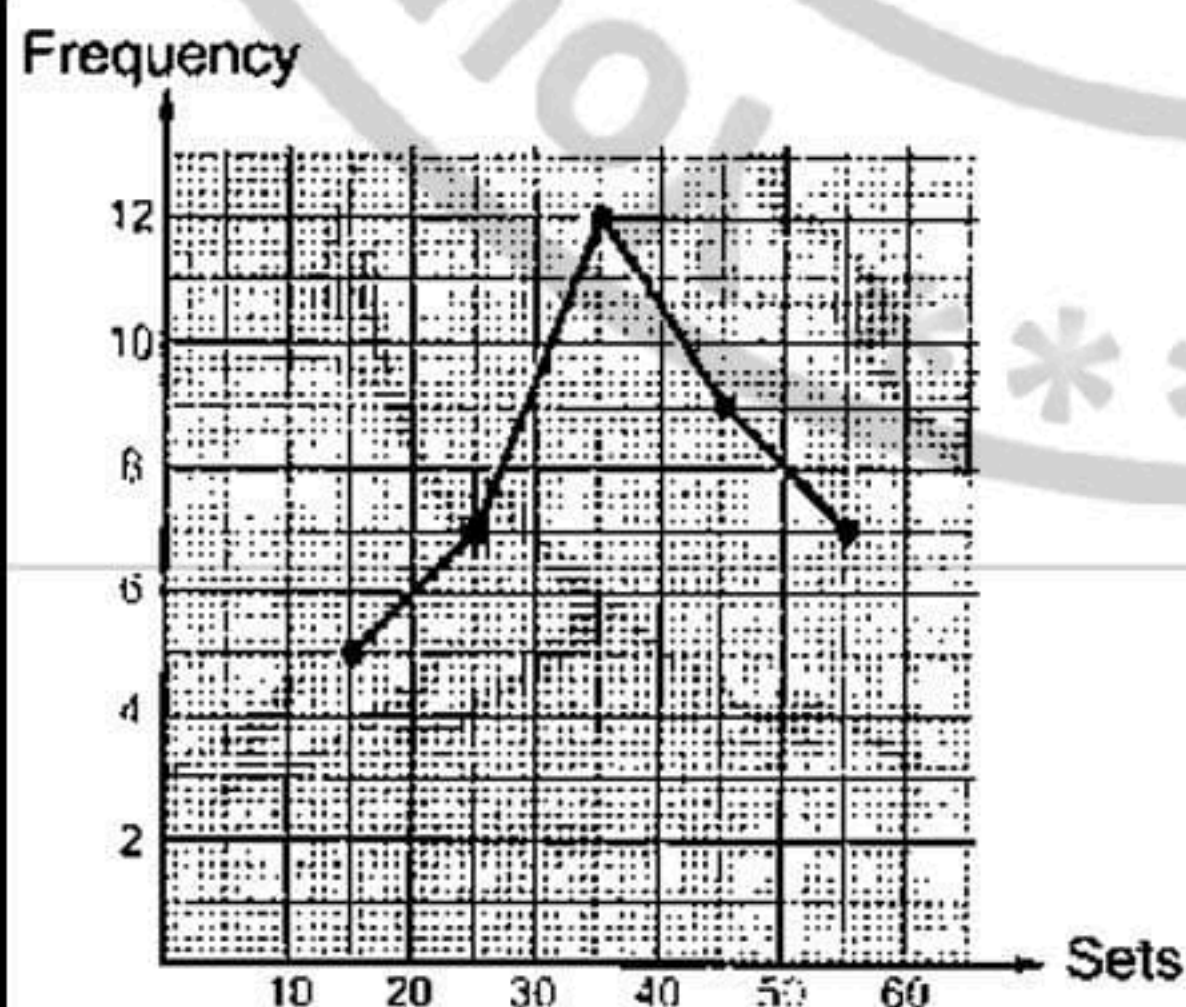
The smallest value = the greatest value - range.

The range = the number of sets  $\times$  the length of set.

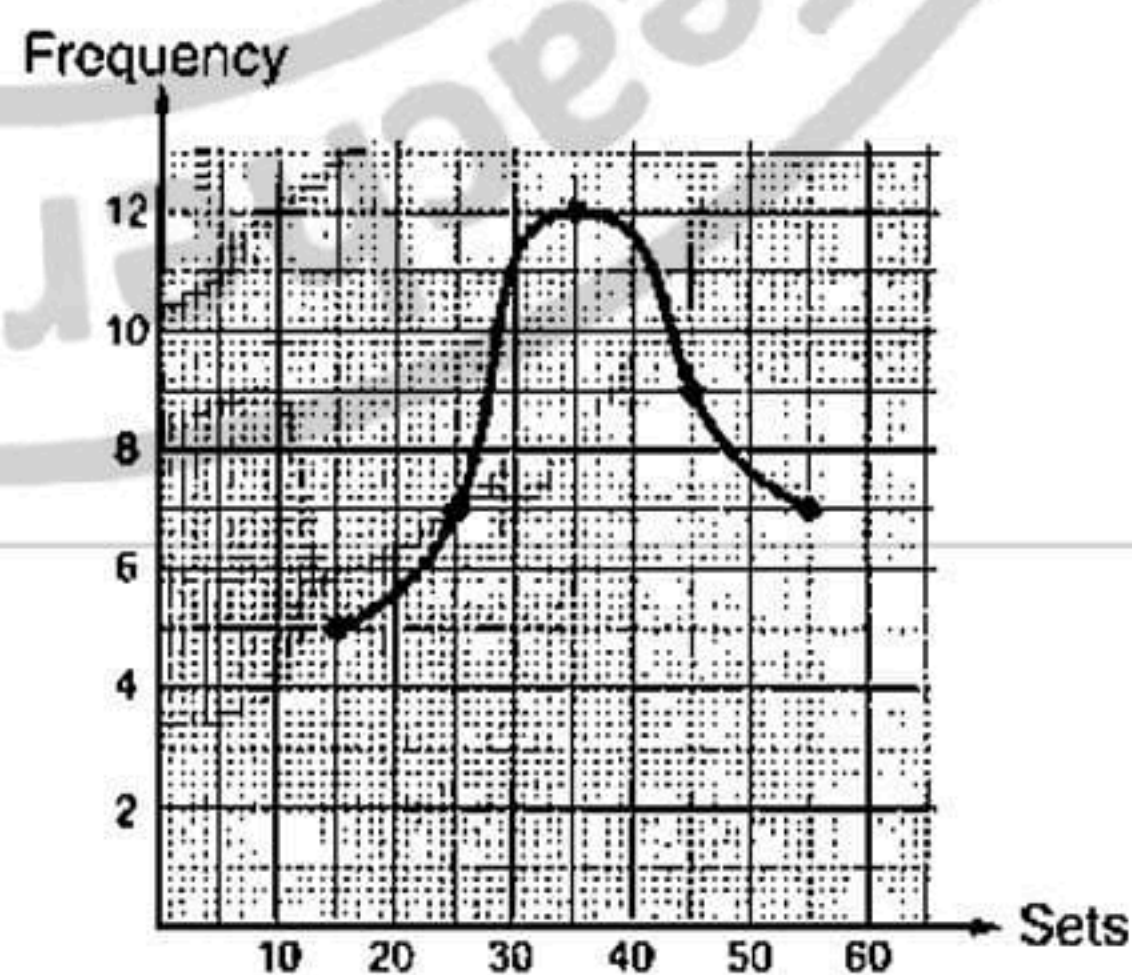
The number of sets = the range  $\div$  the length of set.

The length of set = range  $\div$  the number of sets.

Centre of the set =  $\frac{\text{lower limit} + \text{upper limit}}{2}$



frequency polygon.



Frequency curve